

Executive summary

Prioritizing health

A prescription for prosperity



McKinsey Global Institute

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MGI is led by three McKinsey & Company senior partners: co-chairs James Manyika and Sven Smit and director Jonathan Woetzel. Michael Chui, Susan Lund, Anu Madgavkar, Jan Mischke, Sree Ramaswamy, Jaana Remes, Jeongmin Seong, and Tilman Tacke are MGI partners, Mekala Krishnan is an MGI senior fellow, and Sundiatu Dixon-Fyle is a visiting senior fellow.

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Authors

Jaana Remes, San Francisco
Katherine Linzer, Chicago
Shubham Singhal, Detroit
Martin Dewhurst, London
Penelope Dash, London
Jonathan Woetzel, Shanghai
Sven Smit, Amsterdam
Matthias Evers, Hamburg
Matt Wilson, New York
Kristin-Anne Rutter, London
Aditi Ramdorai, Berlin

Preface

Health is often taken for granted—until something goes wrong. This applies equally to individual lives and to the global economy, as the COVID-19 pandemic has shown. For the past century or more, health improvements from vaccines, antibiotics, sanitation, and nutrition, among others, have saved millions of lives and also been a powerful catalyst for economic growth. Better health promotes economic growth by expanding the labor force and by boosting productivity, while also delivering immense social benefits. However, in recent years, a focus on rising healthcare costs, especially in mature economies, has dominated the policy debate, whereas health as an investment in our societies has largely been ignored. The pandemic is an unwelcome reminder of just how much health matters for individuals, society, and the global economy.

In this report, we focus on what it would take to improve the health of the world's population, and we calculate the benefits for individuals, societies, and economies. The product of a yearlong research effort across McKinsey & Company, this report is a collaboration between the McKinsey Global Institute (MGI) and McKinsey experts in healthcare, life science, and global public health. It builds on MGI's long history of research on economic growth and productivity as well as McKinsey's considerable expertise in health and its publications on topics including productivity in healthcare, digital, analytics, and technology trends, healthcare system reform, the wider determinants of health, and the COVID-19 pandemic. This report is intended to provide insight based on our research and currently available information and not to provide specific advice, medical or otherwise.

The research was led by Jaana Remes, an MGI partner based in San Francisco, and Katherine Linzer, a McKinsey partner in the healthcare practice based in Chicago, together with Jonathan Woetzel, an MGI director based in Shanghai, and Sven Smit, MGI co-chairman and director based in Amsterdam; McKinsey senior partners Penelope Dash and Martin Dewhurst, based in London; Matthias Evers, based in Hamburg; Shubham Singhal, based in Detroit; and Matt Wilson, based in New York, as well as McKinsey partner Kristin-Anne Rutter, based in London. The project team was led by Aditi Ramdorai and included Julia Chin, Ada Cierkowska,

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As with all MGI research, this work is independent, reflects our own views, and has not been commissioned by any business, government, or other institution. We welcome your comments on the research at MGI@mckinsey.com.

James Manyika

Co-chairman and director, McKinsey Global Institute
Senior partner, McKinsey & Company
San Francisco

Sven Smit

Co-chairman and director, McKinsey Global Institute
Senior partner, McKinsey & Company
Amsterdam

Jonathan Woetzel

Director, McKinsey Global Institute
Senior partner, McKinsey & Company
Shanghai

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Prioritizing health: A prescription for prosperity

The COVID-19 shock illustrates that widespread health is essential for global prosperity. Early estimates suggest the pandemic and its repercussions could lead to a 3 to 8 percent drop in global GDP in 2020. Yet each year, poor health reduces global GDP by 15 percent. As the whole world reimagines public health and rebuilds its economy, we have a unique opportunity not merely to restore the past but to dramatically advance broad-based health and prosperity. In this report, we quantify the upside of focusing on health as an investment with economic and social benefits, not just a cost to manage. We analyze almost 200 countries over two decades to 2040 to identify the different challenges and opportunities facing each, and aggregate findings at regional, income archetype, and global levels to provide a synthesis. Key findings include:

- **Using interventions that already exist today, the global disease burden could be reduced by about 40 percent over the next two decades.** Over 70 percent of the gains could be achieved from prevention by creating cleaner and safer environments, encouraging healthier behaviors and addressing the social factors that lie behind these, as well as broadening access to vaccines and preventive medicine. The remainder would come from treating disease and acute conditions with proven therapies including medication and surgery.
- **Reimagining health could bring tremendous benefits: an average 65-year-old in 2040 could be as healthy as a 55-year-old today.** Infant mortality would decline by 65 percent, the health inequity gap would narrow, and 230 million more people would be alive by 2040. Broader social benefits, defined as the welfare value of good health, could be as high as \$100 trillion.
- **Health innovations in the visible pipeline could cut the disease burden by a further 6 to 10 percent.** Pharmaceutical and healthcare innovations will be needed to prevent or treat diseases for some 60 percent

of the global disease burden that we cannot effectively tackle today, including mental and neurological disorders, cardiovascular disorders, and cancers. We identify ten high-impact technologies that already show promise in providing better care, improving the quality of post-therapy life of patients, and slowing aging. These include cell therapy and regenerative medicine, digital therapeutics, and gene therapy.

- **Better health could add \$12 trillion to global GDP in 2040, an 8 percent boost that translates into 0.4 percent faster growth every year.** About half of these annual economic benefits come from a larger and healthier workforce. The remainder come from expanding the capacity of older people, people with disabilities, and informal caregivers to work as well as from productivity gains as the burden of chronic health conditions is reduced.
- **The economic return could be \$2 to \$4 for each \$1 invested in better health.** In higher-income countries, implementation costs could be more than offset by productivity gains in healthcare delivery. Low-income countries continue to need more investment in basic health infrastructure.
- **Realizing the healthy growth opportunity would require a pivot to prevention both within healthcare systems and beyond.** This will not be easy and requires all stakeholders to work together on four imperatives: make health a social and economic priority; keep health on everyone's agenda; transform healthcare systems; and double down on innovation in therapeutics and beyond.

As countries emerge from the COVID-19 crisis, we have a once-in-a-generation opportunity to rethink the role of health in a post-pandemic future. Making health a priority and shifting focus to areas with highest return can improve resilience, reduce health inequity, and promote greater individual, social, and economic well-being.

What would the benefits be from improving health globally?

In a typical year, poor health costs the global economy:

43 days

per person lost to poor health and premature death

5%

productivity loss per worker with chronic conditions

15%

of GDP which is...

2–5x

more than the expected GDP impact from the COVID-19 pandemic

Using known interventions, we could reduce the global disease burden over 40%

● 47% saved from noncommunicable diseases

● 37% saved from infectious diseases

● 16% saved from other diseases

230,000,000

more people would be alive in 2040

>70%

comes from prevention

including environmental, behavioral, and social interventions, and preventive health measures

65

would be the new

55

Middle-age benefit

The health benefits we size would inject \$12 trillion into the global economy in 2040

GDP impact in 2040, \$ trillion

1.4

Fewer early deaths

4.2

Fewer health conditions

4.1

Expanded participation

2.0

Increase in labor productivity

12.0

8% boost to GDP in 2040

\$2–\$4

of economic benefits for every dollar invested in better health



Executive summary

By June 2020, the COVID-19 pandemic had caused hundreds of thousands of deaths around the world, triggered the largest quarterly contraction of global GDP ever recorded, and left hundreds of millions of people without jobs.¹ The associated costs are unprecedented, reaching into trillions of dollars. Yet even in normal circumstances, poor health takes a heavy personal and economic toll. In a typical year, 17 million people die prematurely from a variety of long-term health conditions, many of which are avoidable.² About eight million people die annually—over one-third before reaching their 20th birthday—from infectious diseases that are largely preventable and treatable, amounting to almost 250 million years of lost future life.³ Almost one billion people worldwide suffer from mental health disorders, including more than 200 million children.⁴ And then there are accidents. About 4.5 million people die each year from accidental injuries, with 80 percent under the age of 70.⁵ What would happen if avoidable health conditions were successfully addressed? And what if mental health were improved and accidents reduced?

17M

people die prematurely from a variety of long-term health conditions

In this report, we examine what it would take to improve the health of the world's population and calculate the benefits for individuals, societies, and the global economy. We show that with existing treatments and preventive health interventions, the global disease burden could be reduced by about 40 percent over the next 20 years, a path that we refer to as the healthy growth scenario (see Box E1, "Our research methodology").⁶ That means about one-third fewer deaths from cancers and cardiovascular diseases and about 60 percent fewer deaths from tropical diseases and malaria. Overall, 230 million more people would be alive by 2040. The economic payoff would be significant as their productive potential is realized. By expanding the labor force and increasing productivity, we estimate, the health benefits could be worth \$12 trillion in additional annual global GDP in 2040, an 8 percent uplift to GDP without including additional benefits from future innovations and welfare gains. Improving global health would also improve the resilience of societies and economies when they face unexpected health shocks such as pandemics. But the best part is this: many of the benefits we size can be achieved without significant additional costs. In fact, in higher-income countries, implementation costs could be more than offset by moderate productivity gains in the healthcare system.

That does not mean capturing the health and economic benefits will be easy. It requires reorienting thinking about and investing in health and healthcare delivery, as well as fostering healthier living conditions and changing behavior. It also requires changes in the workplace and economic policy to allow, among others, increased participation of older people in the workforce. However tragic and destructive it has been, COVID-19 has placed society at a unique point in time to prioritize health. Could there be a better moment to invest in global health to promote well-being and prosperity?

¹ According to the latest ILO estimate, there has been a 10.7 percent decline in hours worked since Q4 2019, equivalent to over 300 million full-time jobs. See "ILO Monitor: COVID-19 and the world of work," fourth edition, May 2020.

² Defined as deaths in people aged <70 years from noncommunicable diseases. Institute for Health Metrics and Evaluation. Used with permission. All rights reserved.

³ Defined as years of life lost (YLLs). This measure quantifies the years between death and average life expectancy. Institute for Health Metrics and Evaluation. Used with permission. All rights reserved.

⁴ Institute for Health Metrics and Evaluation. Used with permission. All rights reserved.

⁵ Ibid.

⁶ We define health interventions as actions aimed at assessing, promoting, or improving the health of an individual or population, ranging from public sanitation programs to surgical procedures, recommended by leading institutions like the World Health Organization or national medical associations.

Our research methodology

In this report, we measure the potential to reduce the burden of disease globally through the application of proven interventions across the human lifespan and quantify the impact on population health, the economy, and wider welfare over the period to 2040. We often use shorthand throughout this report to refer to this potential as the healthy growth scenario. Our work provides a pragmatic assessment of the range of interventions that could lead to meaningful health improvement at the population level and boost long-term global economic growth prospects. We conduct our analysis for almost 200 countries; our global, regional, and income-level analyses are aggregated from the country-level analysis.¹

Assessment of the potential to reduce the disease burden

We source our disease burden forecasts to 2040 from the Global Burden of Disease data set developed by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington. This data set includes diseases that cause death and contribute to years lived in poor health. We define diseases broadly as health conditions that affect quality of life, including infectious diseases, chronic conditions, and injuries.

To estimate the reduction in the disease burden achievable in our healthy growth scenario, we conducted a detailed review of clinical evidence and guidelines to identify the interventions, both currently available and in the pipeline, with the greatest potential for scalable reduction of today's disease burden. We did so systematically for the top 52 diseases, which contribute to almost 80 percent of global disease burden, and relied on clinical guidelines and evidence from leading institutions such as the World Health Organization, Disease Control Priorities Network, and academic journals such as *The Lancet*, *New England Journal of Medicine*, and *British Medical Journal*.

to estimate the health improvement potential. In all cases, our aim was to identify a basket of highly effective interventions with wide applicability, roughly 150 in total, rather than to catalog all possible interventions that might be found in a well-resourced and comprehensive healthcare system.

For each individual intervention for the 52 diseases, we followed three steps. First, we sized the health improvement potential. This is an estimate of the share of the disease burden that could be averted through rigorous application of an intervention affecting people with the disease. Second, we estimated the potential to increase adoption from current levels in countries that fall within four income archetypes (high, upper middle, lower middle, and low). For interventions that require ongoing compliance with a treatment program, this adoption estimate includes the sustained adherence and not just initial uptake. Third, we estimated the time required to reach the full impact. This involved two considerations: the time needed for implementation, and the time lag between delivering the intervention and gaining the health benefits from it. Where evidence on current or potential levels of adoption was limited, we made reasonable assumptions based on principles set out in the technical appendix.²

Quantification of the economic impact

To quantify the economic impact of these health improvements, we relied on population and labor force forecasts to 2040 and incorporated the impact of health improvements by age group each year. We then translated the improvements in population health to labor force participation and labor productivity and to GDP through four channels: fewer premature deaths; lower rates of disability among the potential labor force; higher labor market participation among healthier older people, informal caregivers, and people with disabilities; and higher productivity

¹ Country-level data on disease burden are based on the best available evidence; reliability for individual countries varies. In general, epidemiological data are less reliable in lower-income countries, where the resources for disease surveillance, data collection, and quality assurance are limited. We use the World Bank classification system, which groups countries into four categories based on GNI per capita: low income, lower-middle income, upper-middle income, and high income. Afghanistan and Ethiopia are examples of low-income countries, while India and Kenya are examples of lower-middle-income countries. China and Brazil are the largest upper-middle-income countries, and the United States, Japan, and all countries in Western Europe are examples of high-income countries.

² For example, in smoking cessation we assume that adoption of the full range of interventions could reach 50 percent of smokers over 20 years in all countries, and that this would reduce the disease burden medically associated with tobacco use by 59 percent (the effect of giving up smoking) among them, leading to an overall reduction in the disease burden associated with smoking of 29.5 percent over 20 years. For pneumococcal vaccine for people with chronic obstructive pulmonary disorder (COPD), we assume that adoption could increase by 20 percent in high- and upper-middle-income countries over 10 years, and by 60 percent in low- and lower-middle-income countries over 15 years. Based on assessment of clinical evidence, we assume this intervention would reduce the disease burden associated with pneumonia in people with COPD by 29 percent (the mortality reduction observed in vaccinated patients), leading to an overall reduction of 6 percent (higher income) to 17 percent (lower income) of the disease burden associated with pneumonia in COPD over ten to 15 years.

of a healthier workforce. The assumptions used to estimate impact across each of these channels were drawn from academic research where available and tested with an expert advisory group of economists.

Uncertainties in our analysis

A number of uncertainties are inherent in an attempt to understand how global health could be improved and what the benefits would be in 20 years. These uncertainties surround the evolution of the global disease burden, the availability and effectiveness of different interventions (both those currently in use and those in development) in diverse populations, and the impact of improvements in health on society and the economy. We manage these uncertainties in each step of our analysis in the following ways:

1. The evolution of the disease burden. While McKinsey & Company employs many medical experts and scientists, we are not a disease forecasting firm. We rely on disease burden forecasts provided by IHME, which maintains the most comprehensive database of the global disease burden. Forecasts of the global disease burden are inherently uncertain and health shocks such as the COVID-19 pandemic may affect forecasts.

2. The availability and effectiveness of interventions. Our estimates are a snapshot of a very large scientific evidence base that is constantly evolving, often inconclusive, and uneven (in quantity and quality) across disease areas and specific interventions. In addition to the uncertainty inherent in the underlying evidence and our interpretation of it, other aspects of our methodological approach influence our findings. We have mitigated them by sharing and reviewing our approach and interim results with academic and clinical experts at all stages of the research processes, and by providing a detailed description of our method and sources in the technical appendix and bibliography.

3. Future innovations. Research and development in the life and medical sciences is inherently risky and uncertain as is the future rate of adoption of any new technology. We attempted to constrain these inherent uncertainties by looking only at technologies at relatively later stages of development—those that had already passed initial hurdles—and by looking at defined yet relatively broad innovation categories rather than at individual products. We shared and reviewed our method and findings with experts in the field at all stages of the research.

4. Economic potential. In the economic analysis, we make assumptions about what labor market choices people can and choose to make if health benefits are realized. Importantly, we make assumptions about rates of participation in the labor force for groups at different ages and in different health states. These assumptions are grounded in evidence, such as statistics on current and historical rates of labor force participation by age group, country, and health status. Another key assumption was that the labor market could fully absorb additions to the workforce at average levels of productivity. We addressed this uncertainty using a sensitivity analysis, based on a dynamic equilibrium economic model (for more details, see chapter 4).

What this report does not do

This report does not forecast health trends. Its purpose is to provide a sense of the magnitude of potential health and economic benefits that could be achieved by more broadly applying known interventions. Our estimates are not predictions, and we recognize the significant changes needed to achieve the identified health gains in just two decades. We also recognize the risks and threats that could alter the underlying disease burden and the validity of our estimates. In particular, the near- and long-term consequences of new diseases, such as COVID-19, and our response to them, will affect this underlying burden in ways that we cannot reliably quantify today.

This report does not assess current and future healthcare costs. Instead, we provide a high-level estimate of the cost implications of shifting to a healthy growth path by drawing on published research assessing the net cost for countries to implement the interventions identified. These implementation costs are incremental to current healthcare spending but could be largely offset by productivity gains in healthcare spending in middle- and high-income countries.

This report does not make recommendations about spending by any government or organization. It is intended to provide insight into what is possible to achieve with a broad-based improvement in global health. While our study provides a guide for how to improve the health of the world's population, every country has unique local health and economic conditions that should be considered to determine the most effective interventions in each case.

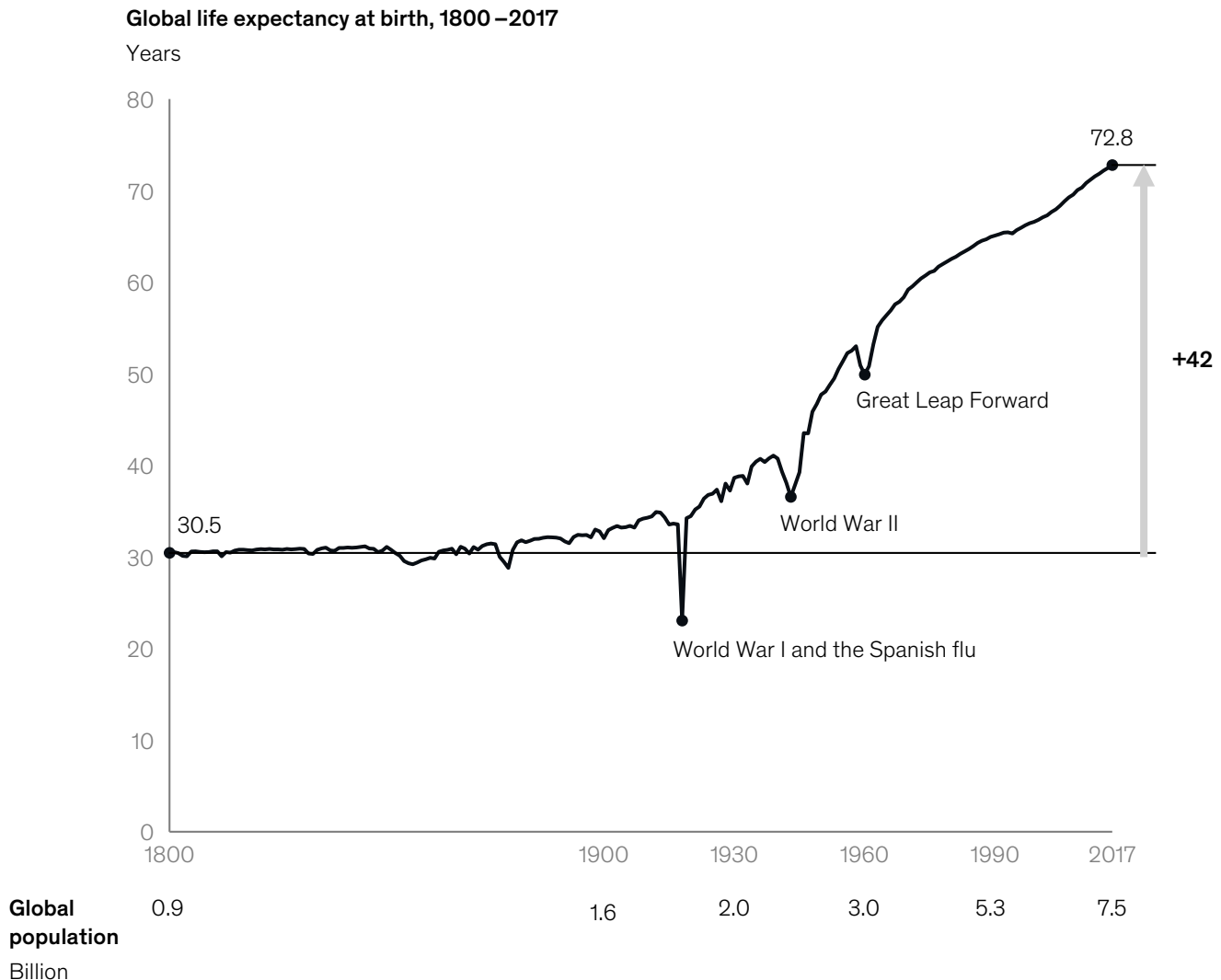
For more details about our methodology, see the [technical appendix](#).

Better health was a catalyst for economic growth in the past and can be a powerful driver once more

Over the past century, improved hygiene, better nutrition, antibiotics, vaccines, and new technologies, among others, have contributed to tremendous progress in global health. Recent innovations have led to dramatic improvements in survival rates for people with certain types of cancer, heart disease, and stroke in many countries.⁷ Improvements in health have extended lives and improved quality of life, contributing to the rapid expansion of the labor force and labor productivity in the second half of the 20th century, which were key factors behind strong economic growth over that period (Exhibit E1).

Exhibit E1

As health improved in the 20th century, life expectancy more than doubled and the global labor force expanded.



Source: Gapminder.org; McKinsey Global Institute analysis

As countries grew richer, they invested in better food and safer environments, creating a virtuous cycle of improved health and higher incomes. Economists estimate that about one-third of economic growth in advanced economies in the past century could be attributed to

⁷ George A. Mensah et al., "Decline in cardiovascular mortality: Possible causes and implications," *Circulation Research*, January 2017, Volume 120, Issue 2; Melina Arnold et al., "Progress in cancer survival, mortality, and incidence in seven high-income countries 1995–2014 (ICBP SURVMARK-2): A population-based study," *The Lancet Oncology*, November 2019, Volume 20, Number 11, pp. 1493–505; Malcolm A. Smith et al., "Declining childhood and adolescent cancer mortality," *Cancer*, August 2014, Volume 120.

improvements in the health of global populations.⁸ Research focused on more recent years has found that health contributed almost as much to income growth as education.⁹

Despite the progress of the past century, in a typical year, poor health and health inequity continue to limit economic prosperity. This plays out in two ways.

First, premature deaths limit growth by reducing the size of the potential labor force. Cardiovascular disorders and cancers are the top conditions that affect the mortality of populations aged 15 to 64, and 55 percent of those premature deaths occur in low- and lower-middle-income countries. A disease such HIV/AIDS takes an exceptionally high toll on the economy because it disproportionately affects people of prime working age. On top of the widespread humanitarian crisis from HIV/AIDS in the 1990s and 2000s, the pandemic particularly affected Southern and Eastern Africa, where HIV prevalence rates among miners were as high as 25 percent in some areas.¹⁰

Second, poor health or morbidity makes it hard for those suffering from health conditions to be economically active and realize their full productive potential. In 2017, a total of 580 million person-years were lost to poor health among those aged 15 and 64, leading them to be absent from work or quit employment altogether.¹¹ In mature economies, one in five workers suffer from a chronic condition—commonly, low back pain, migraine and headache, and anxiety and depression—that affects their productivity at work.¹² For example, in Europe, people with more than one chronic condition are 20 percentage points less likely to be employed than their peers.¹³ Moreover, employees managing chronic conditions experience higher levels of “presenteeism,” defined as being at work but not fully functioning because of illness. In the United States, employees with depression are estimated to lose four hours per week due to presenteeism.¹⁴ In low-income countries, infectious diseases such as tuberculosis (TB) present the largest losses to labor supply and household income. The recovery time for TB is several months, and studies have shown that patients lose three to four months of work time when diagnosed.¹⁵ This can affect output substantially and force households into debt and poverty.¹⁶

Overall, we estimate that the cost of ill health was more than \$12 trillion in 2017, 15 percent of global GDP—or about the same size as China’s economy in that year.¹⁷ Health shocks such as the COVID-19 pandemic, H1N1 influenza, and SARS can result in additional humanitarian and economic costs. The effects of the COVID-19 pandemic, such as the shelter-in-place measures to control the spread of the virus, are forecast to reduce global GDP by 3 to 8 percent in 2020.¹⁸

Health has not typically been part of economic growth discussions, especially in developed countries where the recent debate has revolved around the cost of healthcare, with a few exceptions. We hope this report contributes to a greater understanding of the many ways in

\$12T

cost of ill health in 2017

⁸ Based on estimates from Robert W. Fogel and Suchit Arora. See Robert W. Fogel, “Health, nutrition, and economic growth,” *Economic Development and Cultural Change*, April 2004, Volume 52, Issue 3; Suchit Arora, “Health, human productivity, and long-term economic growth,” *Journal of Economic History*, September 2001, Volume 61, Issue 3. See chapter 1 for more details.

⁹ Jamison et al. analyzed growth rates in 50 countries from 1965 to 1990 and found that better health contributed 11 percent of income growth overall. Investment in physical capital accounted for 67 percent and improved education for 14 percent. See Dean T. Jamison, Lawrence J. Lau, and Jia Wang, “Health’s contribution to economic growth in an environment of partially endogenous technical progress,” in *Health and Economic Growth: Findings and Policy Implications*, Guillem López-Casasnovas, Berta Rivera, and Luis Currais, eds., Cambridge, MA: MIT Press, 2005.

¹⁰ Rose Smart, “HIV/AIDS guide for the mining sector: A resource for developing stakeholder competency and compliance in mining communities in Southern Africa,” World Bank, 2004; David E. Bloom et al., *AIDS and economics*, World Health Organization Commission on Macroeconomics and Health working paper series number WG1:15, November 2001.

¹¹ Measured in years lived with disability, or YLDs, for age group 15 to 64. In total, all ages lost 860 million years in 2017. Institute for Health Metrics and Evaluation. Used with permission. All rights reserved.

¹² Donna Allen et al., “Four-year review of presenteeism data among employees of a large United States health care system: A retrospective prevalence study,” *Human Resources for Health*, November 2018, Volume 16, Issue 1.

¹³ “The labour market impacts of ill-health,” in *Health at a Glance: Europe 2016: State of health in the EU cycle*, OECD, 2016.

¹⁴ Walter F. Stewart et al., “Cost of lost productive work time among US workers with depression,” *JAMA*, June 2003, Volume 289, Number 23; *Health and productivity benchmarking 2016*, Integrated Benefits Institute, November 2017.

¹⁵ *The economic cost of tuberculosis*, WHO, 2000.

¹⁶ Sukhan Jackson et al., “Poverty and the economic effects of TB in rural China,” *International Journal of Tuberculosis and Lung Disease*, October 2006, Volume 10, Issue 10.

¹⁷ This is a total estimate of the cost of poor health, not just health conditions that are avoidable.

¹⁸ Reflects range of several estimates as of June 2020. See: OECD Economic Outlook, June 2020; IMF World Economic Outlook, April 2020; COVID-19: Briefing materials, McKinsey & Company, June 2020.

which health influences the economy and encourages further research into the link between health and economic prosperity.¹⁹ Investments in health could also play an important role in promoting economic recovery in the wake of the COVID-19 pandemic. Furthermore, a number of trends suggest that health may well matter more for growth in coming decades. First, improving health can counter the drag on growth that results from slowing population growth. Labor force growth globally is expected to slow from an annual rate of 1.8 percent over the past 50 years to 0.3 percent in the next 50 years.²⁰ At the same time, the demand for highly skilled knowledge workers is increasing.²¹ Improved health can help counter these longer-term headwinds by extending healthy lifespan for workers of prime working age and older, and by developing the physical and cognitive ability of children, the future labor force of the world.²² Second, health is no longer improving in all regions because obesity-related conditions and mental health challenges are burdening people of all ages, including those of prime working age. In addition, persistent and in many cases growing health inequity creates a gap in health outcomes between rich and poor within societies.²³ Third, healthier populations are more resilient in the face of new infectious diseases, like COVID-19, that often present higher risks to people with existing health conditions.²⁴

10

number of years healthy
middle age could be extended

Use of known interventions could cut the global disease burden by about 40 percent and extend active middle age by ten years

While global health has advanced tremendously during the past century, gains are projected to slow in the future, especially as age-related health conditions become more prevalent. Fortunately, proven interventions are available to tackle some of the most common chronic conditions and infectious diseases. We analyzed the current and future disease burden and found that by more comprehensively applying known interventions, the current global disease burden could be reduced by about 40 percent by 2040.

Overall health improvements are slowing as chronic conditions continue to increase

The global disease burden is projected to decline at a slower rate than in the past, especially in mature economies where the population is aging and facing more age-related health conditions. The disease burden is measured in disability-adjusted life years, known as DALYs, by the Institute for Health Metrics and Evaluation (IHME), the institution that maintains the leading database on the global disease burden. Because each DALY reflects a year of good health lost, health improvements can be measured by the number of DALYs averted.²⁵ According to IHME, over the next 20 years, the global threat posed by infectious diseases such as malaria, tuberculosis, and HIV/AIDS is expected to diminish because of concerted efforts to implement effective treatments (Exhibit E2). While the COVID-19 pandemic has led to an unexpected spike in mortality, our analysis at the time of publication suggests that the impact of premature deaths during the initial wave of the disease is unlikely to materially shift population projections for 2040.²⁶ Greater health gains are expected in low-income countries, many of which lag behind higher-income countries in life expectancy and other measures of health, mainly from preventable and treatable causes such as diarrhea and malaria, nutritional disorders, and poor child and maternal health.

¹⁹ See chapter 1 for more details.

²⁰ Analysis for G-19 countries (the G-20 minus the European Union) and Nigeria; see *Global growth: Can productivity save the day in an aging world?*, McKinsey Global Institute, 2015.

²¹ *Skill shift: Automation and the future of the workforce*, McKinsey Global Institute, May 2018.

²² *Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages*, McKinsey Global Institute, December 2017.

²³ *Environmental health inequalities in Europe: Assessment report*, WHO, 2012; Gareth Iacobucci, "Life expectancy gap between rich and poor in England widens," *The BMJ*, March 2019; Michael Marmot et al., "Closing the gap in a generation: Health equity through action on the social determinants of health," *The Lancet*, Volume 372, Issue 9650, 2008.

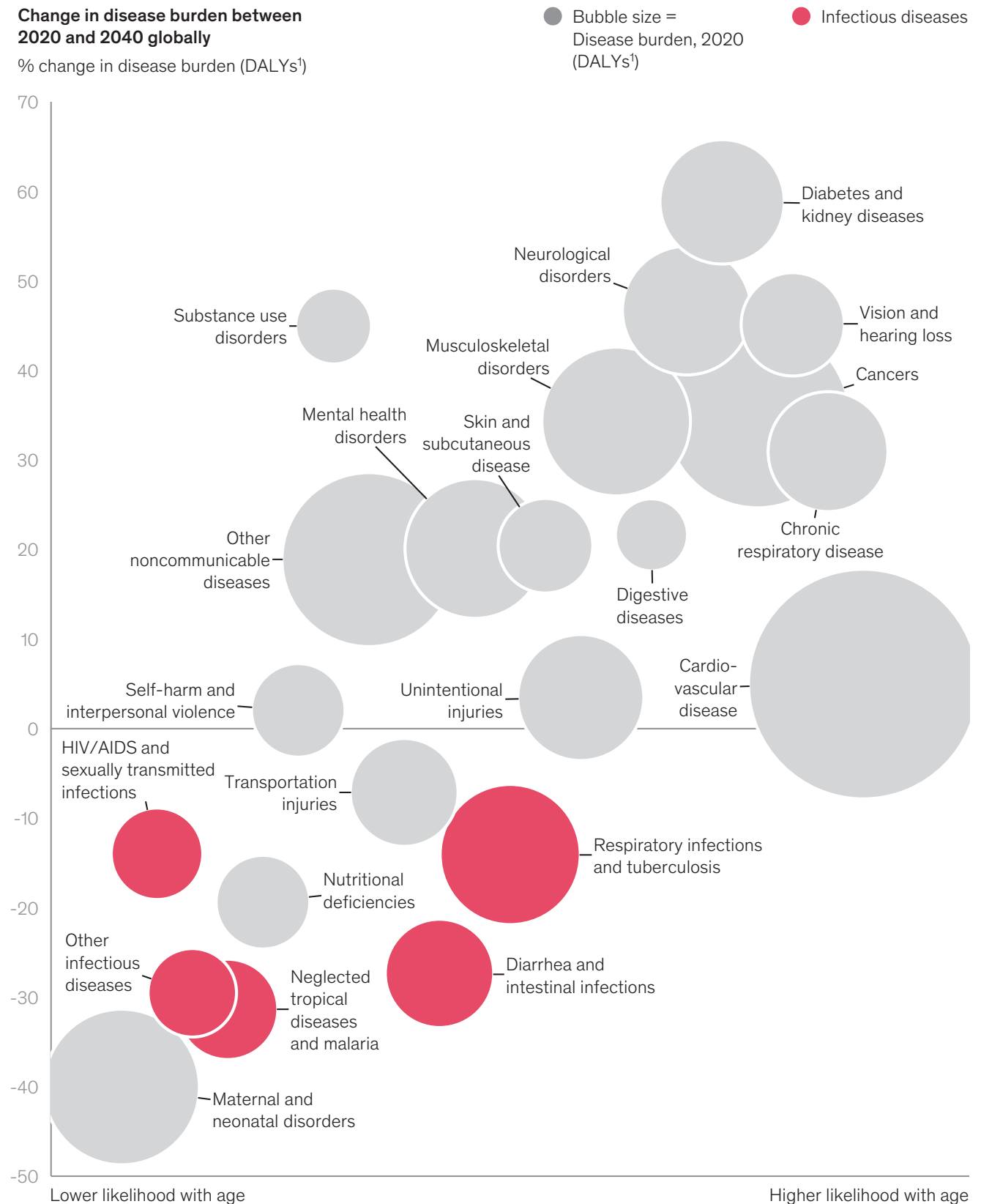
²⁴ Wei-jie Guan et al., "Comorbidity and its impact on 1590 patients with COVID-19 in China: A nationwide analysis," *European Respiratory Journal*, May 2020, Volume 55, Issue 5; Norbert Stefan et al., "Obesity and impaired metabolic health in patients with COVID-19," *Nature Reviews Endocrinology*, April 2020.

²⁵ The DALY is a generic measure that captures both years lost to premature death and the duration and severity of time spent in ill health. DALYs are made up of years of life lost to premature death (YLLs) and years lived with disability (YLDs). YLLs are counted in full years from the age at death to the average life expectancy (specific to the country and year). For example, a person dying from a stroke at 65 in a country where the average life expectancy is 75 will lose 10 YLLs. YLDs are weighted according to the severity of the disease (from 0 to 1). For example, a person living with Parkinson's disease in a place where the condition has a disability weight of 0.35 would lose 0.35 YLD for each year living with the condition.

²⁶ We recognize that there is considerable uncertainty, particularly for low- and middle-income countries.

Looking ahead, incidence of age- and lifestyle-related diseases is expected to rise while many infectious diseases could decrease significantly.

Disease baseline forecast



1. DALY = disability-adjusted life year.

Source: Global Burden of Disease Database 2016, Institute for Health Metrics and Evaluation, used with permission, all rights reserved;
 McKinsey Global Institute analysis

A challenge in all countries is the threat of lifestyle- and obesity-related chronic conditions such as diabetes, cardiovascular disease, and some cancers, all of which tend to rise with income and age.²⁷ Age-related conditions, such as Alzheimer's disease and other dementias as well as vision and hearing loss, are also expected to increase as populations age. As a result, in many high-income countries, healthy life expectancy—years lived in good health—is not keeping pace with rising life expectancy, and additional years gained at the end of life are increasingly spent in poor health.

In addition, many countries may experience additional disease burden associated with the immediate and longer-term consequences of the pandemic, such as delays in diagnosis and treatment of serious conditions such as cancer and tuberculosis, and negative health consequences of substantially higher levels of unemployment.²⁸

With known interventions, ten years could be added to middle age and child mortality could be reduced by 65 percent

We estimate that the current global disease burden in 2040 could be reduced by about 40 percent by applying known interventions in broader segments of populations and with closer adherence to the most effective tools available. This is an aspirational yet realistic estimate given current knowledge and proven practices.

A reduction in the global disease burden of this magnitude would deliver significant health benefits. Child mortality could drop by 65 percent by 2040. Cancer deaths could decline by about 30 percent, cardiovascular disease deaths by about 40 percent, and neglected tropical diseases and malaria deaths by about 60 percent. Overall, 230 million more people would be alive in 2040, half of them under the age of 70. For people at middle age, the shift could extend the number of years in good health by a decade, essentially making 65 the new 55.²⁹ Every region in the world would experience an improvement in this range.

While we find that the overall potential to improve global health is substantial, known interventions vary widely in their capacity to battle specific diseases (Exhibit E3). Some conditions, like diarrhea, respond to effective, low-cost interventions such as oral rehydration that have already helped eradicate them in most high-income economies. Making those interventions available consistently and at scale to the people who need them could similarly reduce the global burden. For other conditions, such as diabetes and cardiovascular disease, prevention and disease management are well understood, but measures to ensure people follow through by taking medication, changing their diet, and exercising, for example, are lacking. Finally, some conditions, like Alzheimer's disease and some types of mental health disorders, are currently beyond medicine's ability to prevent or treat effectively; for these, the disease burden in coming decades is likely to increase until more effective therapies are discovered and implemented.

230M

more people alive by 2040

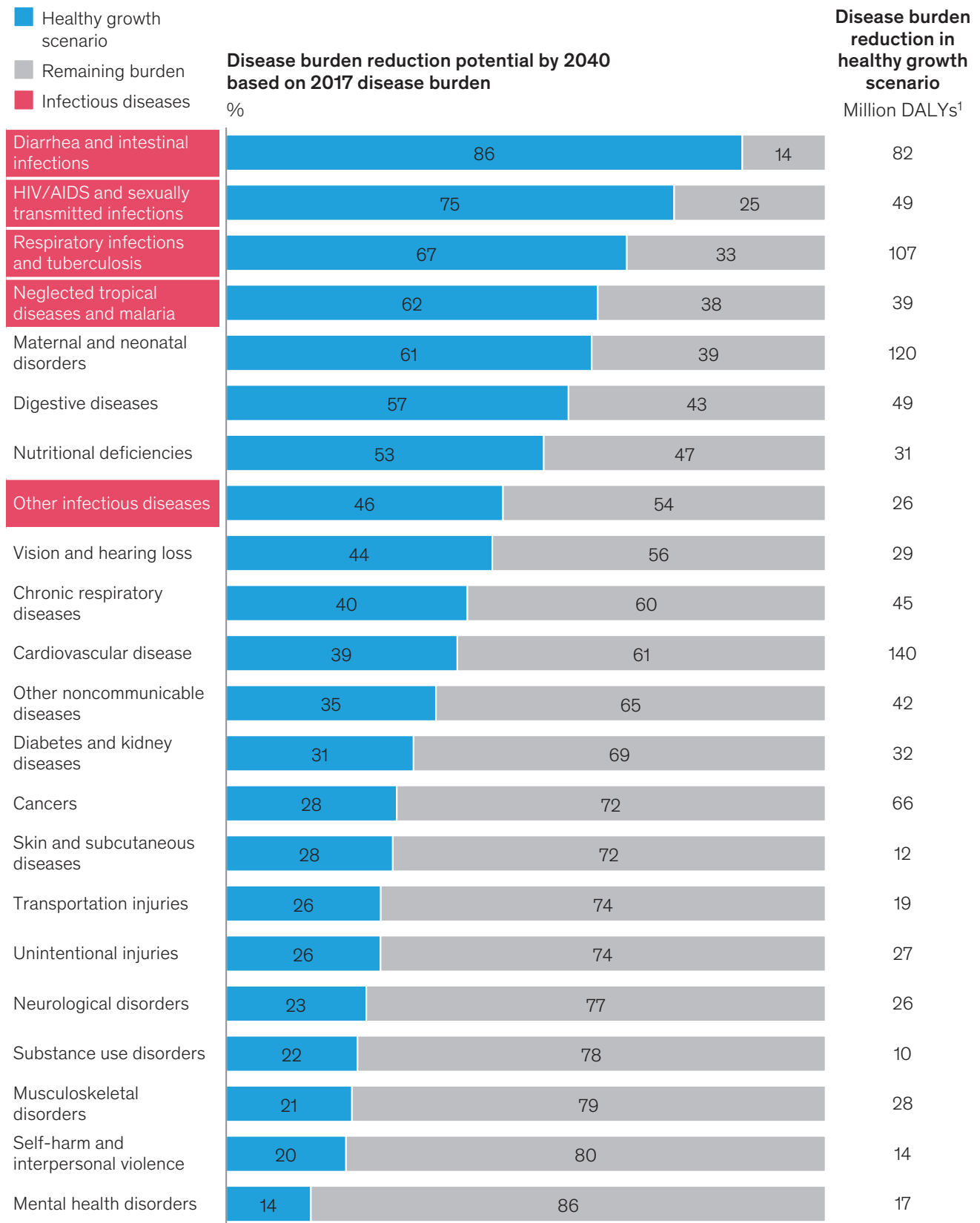
For people at middle age, the shift could extend the number of years in good health by a decade, essentially making 65 the new 55.

²⁷ Fabrizio Ferretti, "Unhealthy behaviours: An international comparison," *PLOS One*, October 2015, Volume 10, Issue 10; Thomas Bollyky et al., "Lower-income countries that face the most rapid shift in noncommunicable disease burden are also the least prepared," *Health Affairs*, November 2017, Volume 36, Number 11; *The heavy burden of obesity: The economics of prevention*, OECD, OECD Health Policy Studies, 2019.

²⁸ Early indications of these additional conditions include: Emily A. Holmes et al., "Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science," *The Lancet Psychiatry*, April 2020; David Cox, "Some patients who survive COVID-19 may suffer lasting lung damage," *Science News Daily*, April 2020; Eleanor Philpotts, "GP urgent cancer referrals decline by more than 70% as fewer patients come forward," *Pulse Today*, April 2020.

²⁹ With the health improvement set out in our healthy growth scenario, a 65-year-old in 2040 would have the equivalent health of a 55-year-old today. This is defined as the probability of survival to a selected age in good health.

The potential to reduce the disease burden varies significantly by disease type; chronic conditions are more challenging to tackle.



1. DALY = disability-adjusted life year.

Note: Figures may not sum to 100% because of rounding.

Source: Global Burden of Disease Database 2017, Institute for Health Metrics and Evaluation, used with permission, all rights reserved; McKinsey Global Institute analysis

Over 70 percent of the health benefits we size come from prevention through healthier environments, behaviors, and preventive care

It has long been known that prevention plays a key role in delivering health benefits. Our analysis demonstrates that the vast majority of health benefits, over 70 percent, are achievable not by treating disease but through preventing it (Exhibit E4).³⁰ In fact, one of the most effective ways to improve health is to invest in communities so that children can grow up and live long and healthy lives as adults. Unpolluted air and water, affordable healthy food, and health literacy shape individual behavior and, together with preventive care (for example, safe childbirth, vaccinations), help reduce the disease burden over the long term. The remaining 30 percent of benefits come from proven therapies to treat existing health conditions.

While these interventions may be known, they are not reaching the people who need them at the right time today. The main challenges include societal failure to assess and address the many unaddressed social and environmental health risks, current incentives that encourage healthcare providers to focus on treatment rather than prevention, and the individual tendency to prioritize immediate needs over longer-term health. The challenge of transitioning to a healthy growth scenario is that it requires change far beyond healthcare systems alone.

A large share of the identified health improvements would cost less than \$100 per additional healthy life year

Cost curves identify interventions with the highest health benefit at the lowest cost. Because the costs of delivering better health vary widely, we estimate them separately for four country income archetypes.

70%

share of interventions
from prevention

In low-income countries, we find the most cost-effective interventions (lowest incremental cost of reducing one year lived in poor health) include childhood immunizations, prevention and treatment of malaria, safe childbirth, better nutrition, and cardiovascular disease prevention. In these countries, the younger population are major beneficiaries, with 42 percent of the healthy life gains going to people under 20 years of age, compared with 18 percent globally. More than 35 percent of the disease burden can be reduced for under \$100 per year of healthy life year gained. For example, diarrhea is a leading cause of preventable childhood mortality worldwide. Almost 90 percent of these deaths could be averted with basic interventions including oral rehydration solutions and oral zinc supplementation, adequate sanitation, and comprehensive childhood immunization.³¹

In lower-middle-income countries, we find midwife-assisted safe childbirth could deliver 1 percent of the total addressable disease burden for 0.1 percent of the total additional costs. Treatment for malaria and TB, and prevention of cardiovascular disease, with support and education for lifestyle change and pharmacological prevention are also very important. More than half of the total health improvement opportunity identified could be delivered through interventions with incremental costs of less than \$100 per year of healthy life gained. Compared to countries with low incomes, a higher share of health improvement can be delivered at lower unit costs in these countries, because the base level of infrastructure—for transport and logistics as well as healthcare—reduces some of the challenge and costs of getting care to the people who could benefit.

In upper-middle- and high-income countries, the greatest health improvement could come from increased use of known preventive strategies for cardiovascular disease and diabetes including weight management, smoking cessation, and prevention and treatment of substance use disorders and low back pain. In all of these conditions, a common challenge is encouraging initial uptake in those who would most benefit and achieving sustained adherence to both medications and behaviors over many years. Cardiovascular disease

³⁰ We estimated the impact of preventive interventions (including environmental, social, behavioral, and medical prevention) on health first, and apply therapeutic interventions only on the remaining disease burden not averted by preventive actions.

³¹ *Progress on household drinking water, sanitation, and hygiene, 2000–2017: Special focus on inequalities*, UNICEF and WHO, June 2019.

Over 70 percent of the health improvement potential from known interventions comes from environmental, social, and behavioral interventions, and preventive health measures.

Disease reduction potential by intervention type¹

100% represents the 41% reduction in the global disease burden

	Top 3 in category		Description	Examples
33%	Environmental, social, and behavioral	Dietary interventions	7% Interventions designed to support people to achieve a nutritious and balanced diet, and to meet specific nutritional goals for people with conditions affected by their dietary intake and weight	<ul style="list-style-type: none"> Iron fortification of staple foodstuffs Nutritional guidance and education for supported weight management
		Supported behavior change	7% Interventions designed to encourage sustained changes in lifestyle and behaviors, including levels of physical activity, eating habits, substance use, and management of stress	<ul style="list-style-type: none"> Fitness tracking app, including goal setting, guidance, and monitoring Peer support group for substance use disorders
		Smoking cessation	4% Full range of national and local policies and support programs to reduce uptake of smoking and encourage smokers to quit (including policies affecting pricing, marketing, and availability of tobacco products; smoking bans; and cessation support)	<ul style="list-style-type: none"> Taxation of tobacco products Nicotine-replacement therapy
38%	Health promotion	Vaccines	11% Medical products designed to provide immunity against a specific disease or group of related diseases by stimulating production of antibodies in individuals receiving the vaccine without inducing development of full disease	<ul style="list-style-type: none"> Measles, mumps, and rubella (MMR) Hepatitis B vaccine Seasonal influenza vaccine
		Safe childbirth	9% Provision of an appropriately equipped and resourced setting for intrapartum care that addresses main risks to maternal and neonatal health (eg, hemorrhage, infection, obstructed labor, and complications related to prematurity)	<ul style="list-style-type: none"> Presence of certified midwife or obstetrician Clean delivery room and sterile equipment Treatment of preeclampsia and eclampsia
		Medicines for heart disease, stroke prevention, and diabetes	7% A range of medicines that reduce risk of disease progression, complications, and mortality from these conditions by regulating blood pressure, cholesterol levels, and blood glucose levels; improving blood flow; and reducing risk of blood clots developing	<ul style="list-style-type: none"> Antihypertensives Statins for cholesterol reduction Metformin for diabetes
29%	Therapeutic	Anti-infective medicines	10% A range of medicines that treat or manage infectious diseases including bacterial, viral, or fungal infections, either by killing the pathogen (eg, bacteria or other microorganism) or slowing or interrupting its growth and ability to replicate	<ul style="list-style-type: none"> Antibiotics for pneumonia Antiretroviral therapy for HIV Artemisinin combination therapy for malaria
		Specialist surgery	5% A range of surgical or interventional procedures used to treat complex conditions such as advanced heart disease, and major trauma; includes routine day surgery procedures (eg, cataract surgery)	<ul style="list-style-type: none"> Cardiac catheterization Major trauma surgery Neonatal surgery
		Counseling and talking therapies	3% Interventions designed to address a range of conditions including mental health disorders, substance use disorders, and self-harm, using psychological techniques and talking in group or individual settings	<ul style="list-style-type: none"> Cognitive behavioral therapy Addiction therapy (eg, 12-step programs)

Source: McKinsey Global Institute analysis

prevention with medication (a combination of antihypertensives and statins) along with lifestyle education could address 3 percent of the addressable disease burden in upper-middle-income countries and would account for only 0.02 percent of the total additional costs. Even in high-income countries, we find that almost 60 percent of interventions cost less than \$1,000 per year of good health (Exhibit E5). Australia's approach to smoking cessation is an example of public policy intervention.³² Smoking prevalence in Australian adults fell from 35 percent in 1980 to 14 percent in 2016, with similar sharp decreases in tobacco consumption by teenagers. Key interventions included awareness and media campaigns, comprehensive bans on tobacco advertising, assistance programs to quit smoking, banning smoking in public places, and high taxes on cigarettes.

In addition to interventions that improve health, steps to prepare for future health shocks such as pandemics will be important across countries (see Box E2, "Societies will also need to consider how to prepare for a broad range of potential health shocks, including future pandemics").

Box E2

Societies will also need to consider how to prepare for a broad range of potential health shocks, including future pandemics

Improving global health will bolster the resilience of societies and economies when faced with unexpected health shocks. People with preexisting conditions, such as obesity and heart disease, have been particularly vulnerable during the COVID-19 pandemic.¹ In parallel, societies can take specific measures to be better prepared for the unpredictable health crises ahead. This will require effort on several fronts.

First, prevention to reduce the frequency of hazards, exposure to them, and the impact of that exposure. This includes comprehensive vaccination development programs, environmental and agricultural standards to reduce the risk of novel diseases crossing from animals to humans, and minimum standards for cybersecurity to protect healthcare systems.

Second, planning and preparedness, which includes effective and internationally coordinated disease and risk surveillance, early warning systems, and sharing of best practices.

Finally, investment in technology to improve the speed and quality of response. This includes investment in tests, vaccines, treatments, and other solutions, but also strategies for tracking and managing disease spread and transmission. In many cases these investments build on the strong primary and community care systems and structures that support broader population and public health, including data and analytics.

¹ ICNARC report on COVID-19 in critical care, Intensive Care National Audit and Research Centre, April 2020.

Ten innovations in the visible pipeline could reduce the total disease burden by a further 6 to 10 percent by 2040

Today's interventions are the innovations of the past. Without them, healthy lifespans would not be as long as they are. Innovation continues to be critical to tackle diseases without a known cure as well as help us increase uptake and adherence to interventions we know work. Leading the list of diseases without a known cure are mental health and neurological disorders, cardiovascular disease, and cancers. The good news is that innovations that completely change the lives of patients continue to emerge and prove the continuing power of innovation. One example is the nearly 70 percent reduction in premature death due to chronic myeloid leukemia in Switzerland from 1995 to 2017.³³

We identify ten promising innovations in progress that could have a material impact on health by 2040 (Exhibit E6). We determined these technologies by focusing on areas with

³² Elizabeth Greenhalgh, Michelle Scollo, and Margaret Winstanley, *Tobacco in Australia: Facts and issues*, Cancer Council Victoria, 2020.

³³ Institute for Health Metrics and Evaluation. Used with permission. All rights reserved.

In high-income countries, cardiovascular disease prevention and smoking cessation have the most potential to improve health.

High-income countries

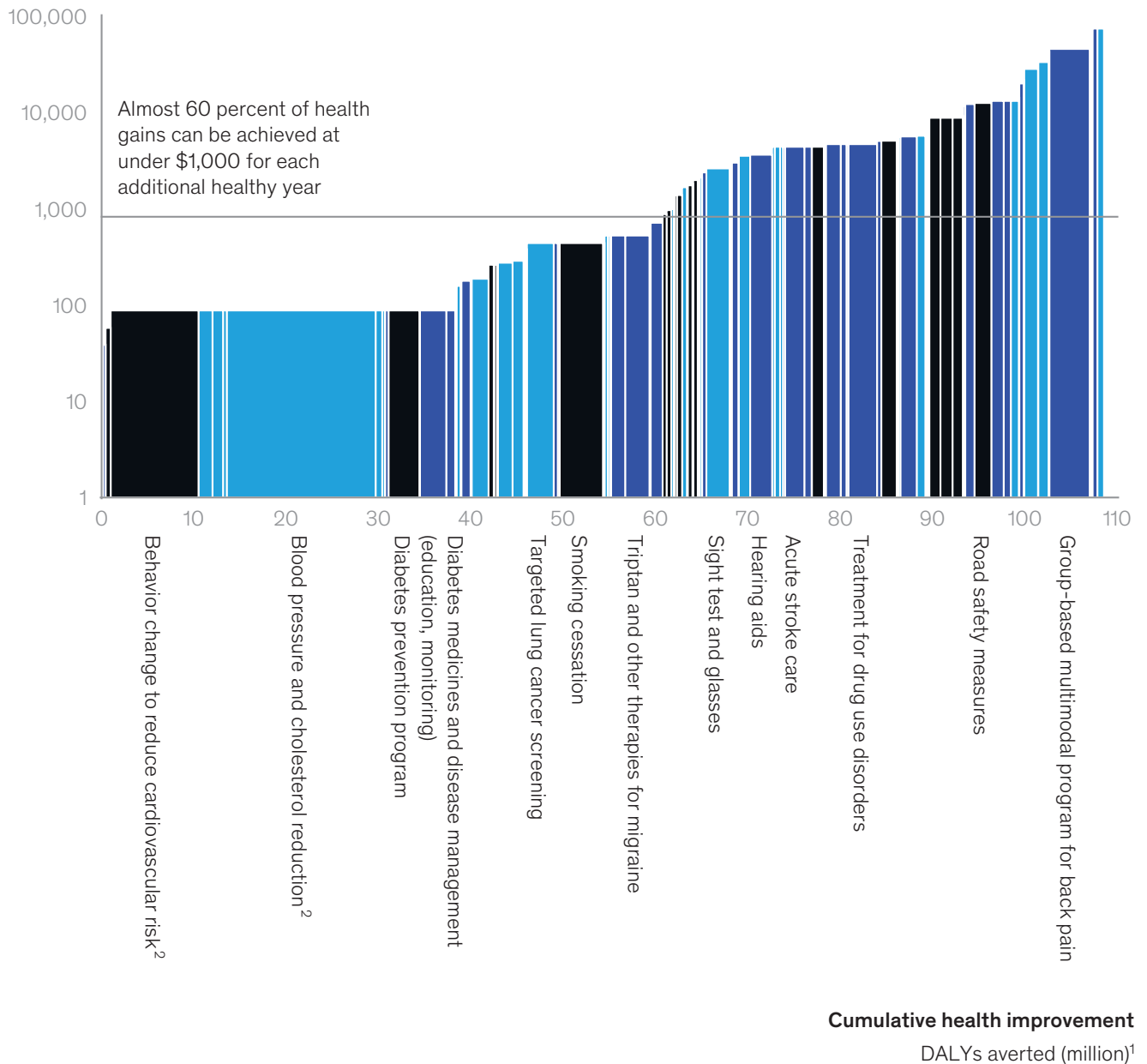
■ Environmental, social, and behavioral

■ Prevention and health promotion

■ Therapeutic

Cost-effectiveness

Cost per DALY averted (\$, log scale)¹



1. DALY = disability-adjusted life year.

2. Pharmacological prevention of cardiovascular disease includes use of antihypertensives and statins (and/or other cholesterol-lowering medicines). Cardiovascular lifestyle education includes physical activity, diet, smoking cessation, and alleviation of other risks. These interventions are delivered as a combined program.

Note: Interventions are ordered in ascending order of cost for every healthy life year. The higher the disease burden reduction potential, the larger the width under each intervention.

Source: Institute for Health Metrics and Evaluation, used with permission, all rights reserved; WHO, *Updated Appendix 3 of the WHO global NCD action plan 2013–2020*, April 2017; "Disease Control Priorities 3 (DCP-3): Economic evaluation for health," University of Washington Department of Global Health, 2018; Tufts Cost-Effectiveness Analysis Registry; McKinsey Global Institute analysis

the greatest combination of unmet need, biological understanding of the disease pathway, and the effort and excitement surrounding each, measured by funding. While identifying and sizing the potential scope of innovations in the pipeline is inherently difficult, we estimate that these technologies have the potential to reduce the disease burden by a further 6 to 10 percent, on top of the 40 percent from known interventions, assuming aspirational yet realistic adoption rates by 2040. Not only could some of these innovations be fully curative for some diseases, but by tackling the underlying biology of aging, they could significantly extend healthy lifespan by postponing the onset of several age-related conditions. This contrasts with innovations of the past 30 years, many of which reduced symptoms or delayed disease progression while prevention and cures were rare. Additionally, the innovations we have identified here are more digitally enabled than in the past. As an example, artificial intelligence (AI) systems make advances in omics and molecular technologies, such as gene editing, faster and more accurate.³⁴

Realizing these innovations will require continual investment in research and development across pharmaceutical companies, medical and other technology companies, and academia.

Better health could add \$12 trillion to global GDP in 2040, far more than implementation costs

245M

more people employed by 2040

Often healthcare discussions tend to focus on older cohorts. However, almost 70 percent of health improvements we identify accrue to the global population under 70 years of age. This would in turn increase the size and productivity of the labor force, boosting annual GDP growth globally by 0.4 percent every year over the next two decades. These benefits generate an estimated economic benefit of \$2 to \$4 for each \$1 invested in improving the health of the global population. That is before accounting for the additional value unlocked by forthcoming innovations or the broader social benefits to individuals, families, and communities.

A larger, healthier, and more productive labor force could counter demographic headwinds and boost global growth

The economic benefits from the health improvements we size are substantial enough to add \$12 trillion or 8 percent to global GDP in 2040 (Exhibit E7). These benefits arise through the labor market, both by expanding future employment through fewer early deaths, fewer health conditions, and higher labor force participation of healthier people and through the productivity gains achievable by workers who are physically and cognitively healthier.

By 2040, 245 million more people could be employed. About 60 million of them would have avoided early death from cardiovascular disease, cancers, malaria, and other causes, adding \$1.4 trillion to 2040 GDP. Addressing mental health disorders, diabetes, or other conditions would no longer be a barrier to joining the labor force, for an equivalent of about 120 million full-time workers contributing an additional \$4.2 trillion. Another \$4.1 trillion could be unlocked by expanding labor force participation among three groups: older populations for whom better health can be an opportunity to work longer (about 40 million people), informal caregivers who no longer need to care for loved ones (12 million people), and people with disabilities who can go to work because workplaces adapted to accommodate their needs (eight million people).

Lastly, improving health could drive up productivity and lift GDP by as much as \$2.0 trillion by reducing presenteeism from chronic conditions such as low back pain, but also through investing in childhood nutrition, which improves the cognitive and physical health of the future workforce. Just addressing adolescents' mental and behavioral health issues, which affect about 60 million young people globally, could unlock \$600 billion by 2040 through raising their educational attainment and earnings potential.

³⁴ *The Bio Revolution: Innovations transforming economies, societies, and our lives*, McKinsey Global Institute, May 2020.

We have identified ten promising technology categories.

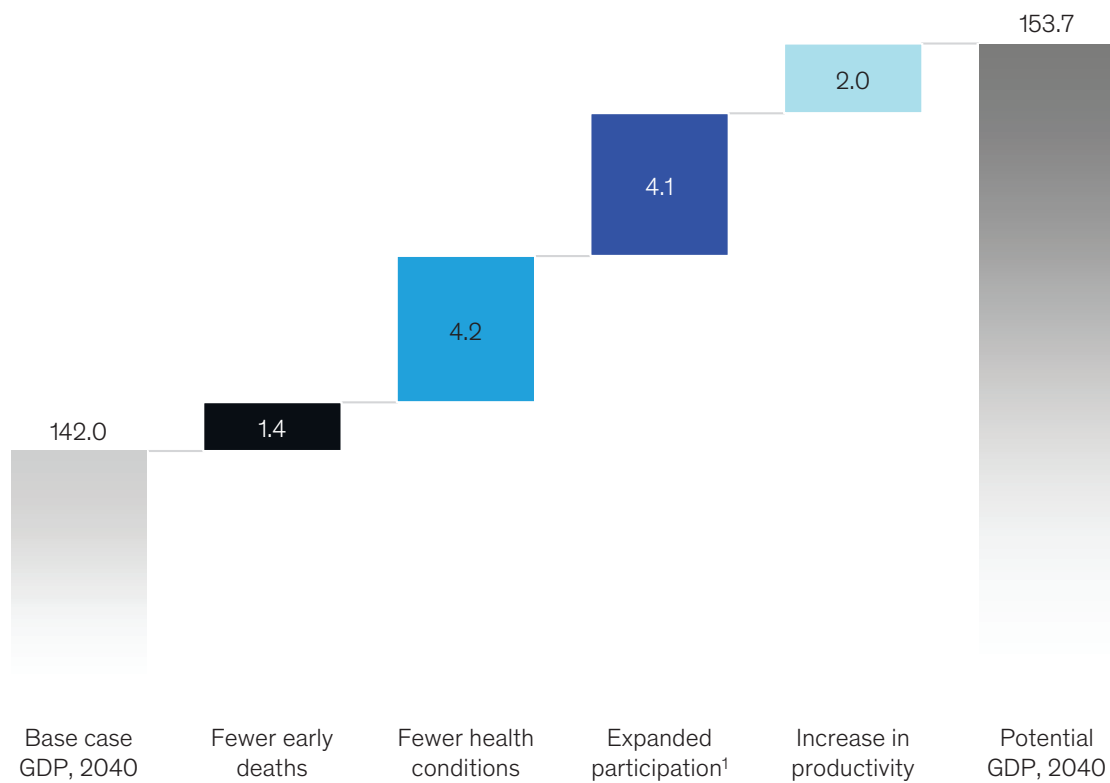
Technology category	Example technology
Omics and molecular technologies A medicine or diagnostic created by harnessing the power of molecules at a subcellular level; includes genome editing and proteomics	 CRISPR and curbing malaria Genetic modification of malaria-carrying mosquitoes using gene-editing technologies (eg, CRISPR); may potentially enable significant disease reduction by propagating the modified genes across the mosquito population
Next-generation pharmaceutical Newer iterations of traditional chemical compounds (small molecules) and classes of molecules used as medicinal drugs, possibly with multiple and concurrent target structures	 Senolytics and regulation of cellular aging Senolytics (a class of small molecules) may decrease or eliminate aging cells that can cause cellular inflammation, dysfunction, and tissue damage; has implications for delaying the occurrence of age-related diseases
Cellular therapy and regenerative medicine <i>Cellular therapy</i> —a biological product, derived from living cells, used for therapeutic purposes to replace or repair damaged cells and/or tissue <i>Regenerative medicine</i> —a therapy with the power to restore diseased and/or injured tissues and organs, potentially decreasing reliance on transplantation	 CAR T-cell therapy and treatment of solid tumors CAR T-cell therapy reprograms a patient's T-cells (immune system cells) against tumor cells; when infused into the patient, the T-cells bind to an antigen on tumor cells, attacking and destroying them
Innovative vaccines Substances that stimulate the immune system to respond to and destroy a bacterium, or virus; historically, vaccines have eradicated and/or controlled the spread of a number of infectious diseases around the world, and in the future, they may be used to target noncommunicable diseases (eg, cancer)	 The AT04A vaccine and the lowering of cholesterol AT04A is a vaccine made up of molecules that bind to blood cholesterol and degrade it; vaccination would be required only once a year, potentially improving outcomes
Advanced surgical procedures Advances in the treatment of injuries or disorders with minimally invasive incisions and/or small instruments, including robotic surgery; also includes any technique that improves surgery-related processes outside the operating room	 Suspended animation for severe trauma patients A cold saline solution could be injected in the first contact with the patient to cool the body to 10–15°C and stop its function, allowing time for surgeons to operate before resuscitating the patient
Connected and cognitive devices Portable, wearable, ingestible, and/or implantable devices that can monitor health and fitness information, engage patients and their community of caregivers, and deliver self-regulated therapies autonomously	 E-tattoos for heart diagnostics Ultra-thin e-tattoos can provide longer periods of heart monitoring and increase patient comfort while providing a wider range of data to enhance clinical decision making
Electroceuticals Small therapeutic agents that target the neural circuits of organs; therapy involves the mapping of neural circuitry with neural impulses (administered via an implantable device) delivered to these specific targets	 Implantable microchips and the mitigation of chronic pain Spinal cord stimulation can improve patient quality of life, allowing increased mobility, enhanced sleep, and reduced need for pain medication
Robotics and prosthetics A wide variety of programmable, self-controlled devices consisting of electronic, electrical, or mechanical units and artificial substitutes or replacements for a part of the body	 Next-generation exoskeletons and mobility support Next-generation exoskeletons, powered by small motors that mimic human muscles, could allow older patients to recover their autonomy while reducing the likelihood of accidents and falls
Digital therapeutics Preventive and therapeutic evidence-based interventions driven by software for a broad spectrum of physical, mental, and behavioral conditions	 AI-powered app to enable behavior change Digital therapeutics powered by AI, patient data, and behavioral science can help patients adopt and sustain health behaviors through gamification and other forms of engagement
Tech-enabled care delivery Technology-enabled care delivery that incorporates new and larger data sets, applies new analytics capabilities to determine insights, and applies those insights to providers and patients to improve care outcomes, experience, and efficiency	 Multichannel care delivery Multichannel care delivery using online platforms may facilitate data sharing and improve treatment efficiency; particularly relevant for chronic diseases like diabetes where the patient's glucose levels and other vital signs are continuously shared with the specialist

Source: McKinsey Global Institute analysis

Global GDP could rise by about \$12 trillion in 2040, an 8 percent increase, mainly from fewer health conditions and expanded participation in the labor force.

GDP, 2040

\$ trillion



**Annual
growth rate,
2020–40**

2.6%

3.0%

1. Includes impact on older adults (only high- and upper-middle-income countries), informal caregivers (only in OECD), and people with disabilities (global).

Source: Institute for Health Metrics and Evaluation, used with permission, all rights reserved; Oxford Economics; ILOSTAT; OECD; Eurostat; National Transfer Accounts project; McKinsey Global Institute analysis

The expansion of the labor supply in the healthy growth scenario could add 0.3 percent to global employment growth. One-fifth of the new labor market entrants would be in high-income economies, where this expansion could fully counter the projected slowdown in labor force growth. The rest, 80 percent, would improve health and increase the labor force in low- and middle-income countries.³⁵ (See Box E3, “Variations in the disease burden and labor market structures determine health opportunities for individual countries.”)

Because preventive health benefits—about 70 percent of the untapped opportunity we identify—tend to accrue and pay off over a lifetime, the benefits would continue to rise beyond 2040. The health impact from innovations would also take time to flow through but could contribute an additional \$5 trillion to annual GDP after 2040.

³⁵ In many low- and middle-income economies, populations are younger but suffer from more health conditions and have higher rates of premature mortality. This means that health benefits accrue to younger cohorts with longer economically active lives ahead. However, realizing this economic potential depends on additional factors, including access to education, and capital for investment and infrastructure to create high-value employment opportunities. We recognize that this is a challenge in many parts of the world.

The social benefits of improved health far exceed the economic benefits, estimated to be approximately \$100 trillion by 2040

Ill health diminishes the ability to enjoy life and all that it has to offer, creating a physical, emotional, and financial burden for individuals, families, dependents, and caregivers. Beyond working, better health would give people the freedom to spend their leisure time on what they want to do most. This includes older people, many of whom may choose to give back to society in other ways after retirement. We estimate that having a healthier population aged 65 and up could add \$20 billion to \$30 billion in value to societies in 2040 through volunteering alone. Our GDP estimates do not capture the benefits of volunteering, stronger social relationships, and happier retirees, all factors that would further help transition to a healthier growth path by helping maintain better health.

\$100T

worth of social benefits from
better health

While more challenging to value in dollars, we estimate the social benefits from improved health by applying the approach used in economics to measure welfare.³⁶ We estimate the total combined value of deaths averted and reduced ill health could reach \$100 trillion without adjustments for income levels—eight times the estimated GDP benefits.³⁷ This number is so high because people typically value good health above everything else. Improving health could also help narrow health disparities within countries and across countries. This in turn could contribute to reducing income inequality within countries and strengthening the social contract.³⁸

Viewed on a cost-benefit basis, focusing on known health improvements could deliver an incremental economic benefit of \$2 to \$4 for each \$1 invested

The economic and welfare benefits we have estimated far exceed the implementation costs of achieving this level of health improvement, delivering a GDP uplift of \$2 to \$4 for each \$1 invested over 20 years (Exhibit E9).³⁹ Realizing the benefits would mean shifting spending to prevention.⁴⁰ Prevention of diseases usually is less expensive than treatment and reduces the need for more expensive treatment later on, contributing to a high economic return. Shifting incremental spending to prevention would not be simple, however, because it requires substantial changes in where and how healthcare is delivered, as well as changes to communities that would help individuals grow up, work, and age in healthy ways. It is important to note that our economic analysis should not be interpreted as calling for additional funding for healthcare as currently delivered, but as an alternative approach under which health needs are addressed early, with proven, effective, typically lower-cost approaches.

A key question is what this transition would cost in different countries. The answer varies by region. In developed countries with established healthcare systems, the benefits of shifting from treatment to prevention are high and the incremental costs low. Even a moderate improvement in healthcare delivery efficiency could more than pay for the additional spending required. Researchers find opportunities in all countries to reduce healthcare delivery costs by up to 22 percent from today's levels through higher productivity. This includes standardizing operational processes in clinical and nonclinical areas, transitioning to lower-intensity settings of care where appropriate, addressing unnecessary duplication of services, reducing medical errors, avoiding clinically ineffective activity, and increasing levels

³⁶ Many economists, including the members of the Lancet Commission on Investing in Health, quantify the financial value of welfare or societal benefits by measuring "inclusive income" on the basis of "willingness to pay" for health gains. This value is typically determined by surveys using monetary and health trade-offs. For more details, see Dean Jamison et al., *Investing in health: The economic case: Report of the WISH Investing in Health Forum 2016*, World Innovation Summit for Health (WISH), 2016.

³⁷ This analysis uses a single global value per additional healthy life year. See chapter 4 and the technical appendix for more details.

³⁸ *The social contract in the 21st century: Outcomes so far for workers, consumers, and savers in advanced economies*, McKinsey Global Institute, February 2020.

³⁹ Positive economic return does not mean all countries can afford the initial investment required; the full benefits of preventive interventions can take years to realize and require a societal perspective, because the returns are accrued across society and not directly to the initial investor. We look at transition costs in more detail in chapter 4.

⁴⁰ Our analysis focuses on the incremental healthcare expenditure required to transition to the healthy growth scenario, not overall healthcare spending pattern changes. Our analysis suggests that to achieve the healthy growth scenario, the majority of new investment should be allocated to prevention, including environmental, social, and behavioral interventions, as well as promotion of prevention and health. This would suggest an overall rebalancing in favor of greater spending on prevention, but we have not assessed overall allocations (across total healthcare expenditure), which vary by healthcare system depending on current baseline spending allocation, levels of unmet need, and other factors.

Variations in health outcomes and labor market structures determine economic opportunities for individual countries

A larger and healthier labor force translates into substantial economic benefits across all countries. Yet underlying differences in the health outcomes and labor market structure shape the opportunities individual countries have to capture those economic benefits (Exhibit E8). Highlights from the patterns we observed include:

In the **United States and Canada**, significant opportunity comes from reducing obesity-related conditions and substance use disorders. Mortality rates for substance use disorders, for example, are six times higher in the United States than in Western Europe. Addressing low back pain, migraines, and mental health disorders is also a large opportunity in the United States, Australasia, and Western Europe. In **Western Europe**, broadening the opportunities for people to remain in the labor force provides the biggest boost to GDP because the effective retirement age remains low in many countries.¹

In **Eastern Europe and Central Asia**, one of the biggest opportunities lies in averting premature deaths from ischemic heart diseases and stroke, both of which occur at higher rates than in Western Europe. Controlling high rates of excess alcohol use and smoking could reduce the risk of developing several of these conditions as well as lung and liver illnesses.²

In **East Asia**, cardiovascular disease is a big and growing killer, linked to changing diets and lifestyles. Averting deaths from chronic obstructive pulmonary disease will have a major impact in coming decades. Increases in chronic lung conditions are mainly linked to higher rates of smoking and indoor and outdoor air pollution in Asian countries.³

In **Latin America**, opportunities come from preventing and treating cardiovascular disease as well as reducing low back pain and vision impairment. The prevalence of blindness is much higher in Latin America than in the United States. Researchers estimate that 43 to 88 percent of blindness in Latin America is caused by cataract and refractive errors that could be curable.⁴

In **South Asia and sub-Saharan Africa**, investing in child health today would have a significant payoff in the future. Sub-Saharan Africa would have 3.3 million more young adults alive by 2040 if the health of children were improved with better childbirth practices, treatment of lower respiratory diseases, and prevention of diarrhea and malaria, among others.

¹ As people in middle age become healthier, they may choose to stay in the workforce longer. We size the economic potential impact if the labor force participation of people between 65 and 69 would increase to current levels of labor force participation of people between 60 and 64 today.

² Elizabeth Wilkins et al., *European cardiovascular disease statistics 2017*, European Heart Network, February 2017.

³ Wan C. Tan and Tze P. Ng, "COPD in Asia: Where East meets West," *Chest*, February 2008, Volume 133, Issue 2.

⁴ Hans Limburg et al., "Review of recent surveys on blindness and visual impairment in Latin America," *British Journal of Ophthalmology*, March 2008, Volume 92, Issue 3.

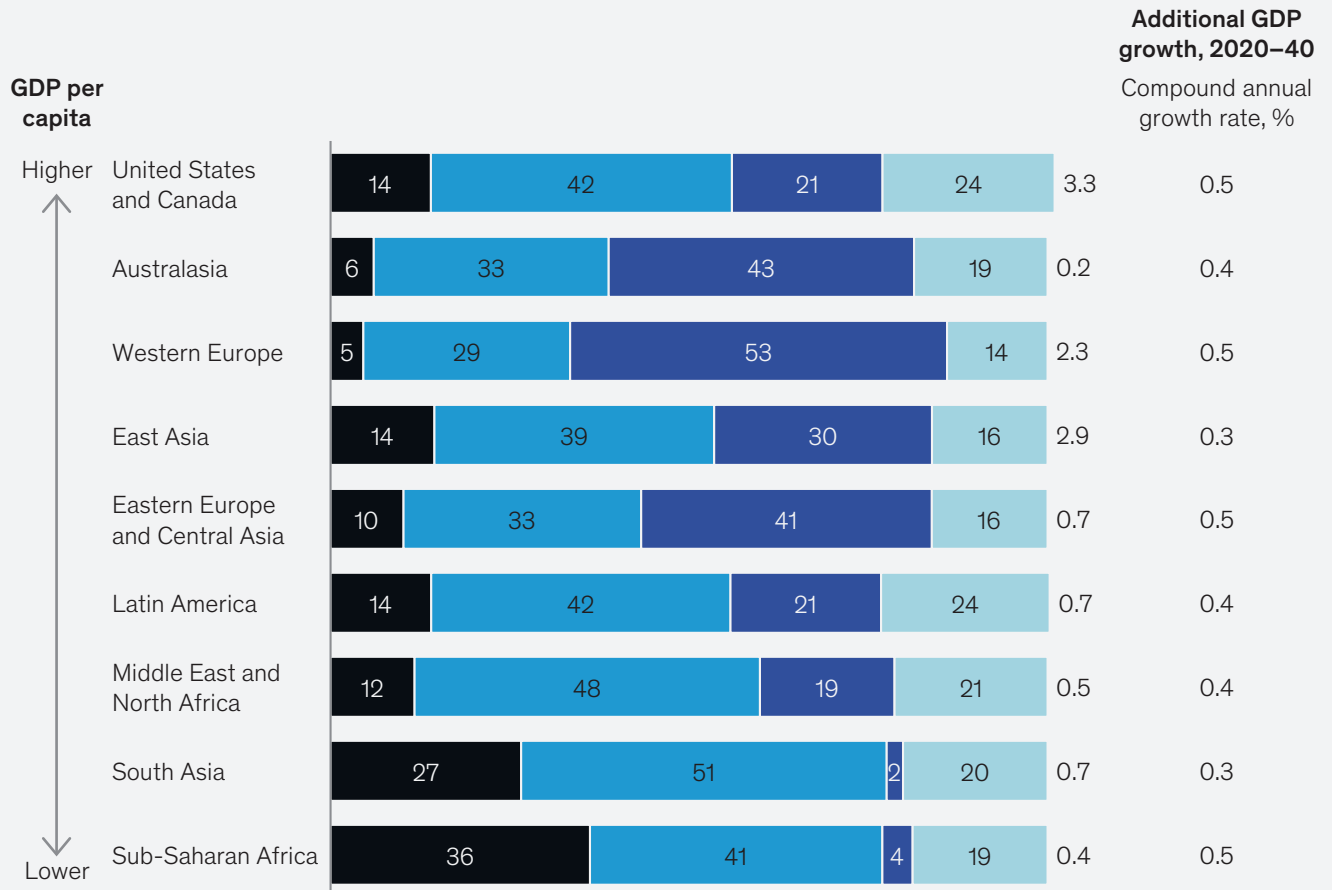
Across regions, the economic benefits of better health are driven by differences in the underlying disease burden and labor market structures of countries.

GDP impact breakdown, 2040

Healthy growth scenario

%; \$ trillion

Fewer early deaths
 Fewer health conditions
 Expanded participation
 Increase in productivity



Note: Figures may not sum to 100% because of rounding.

Source: Institute for Health Metrics and Evaluation, used with permission, all rights reserved; Oxford Economics; ILOSTAT; OECD; Eurostat; National Transfer Accounts project; McKinsey Global Institute analysis

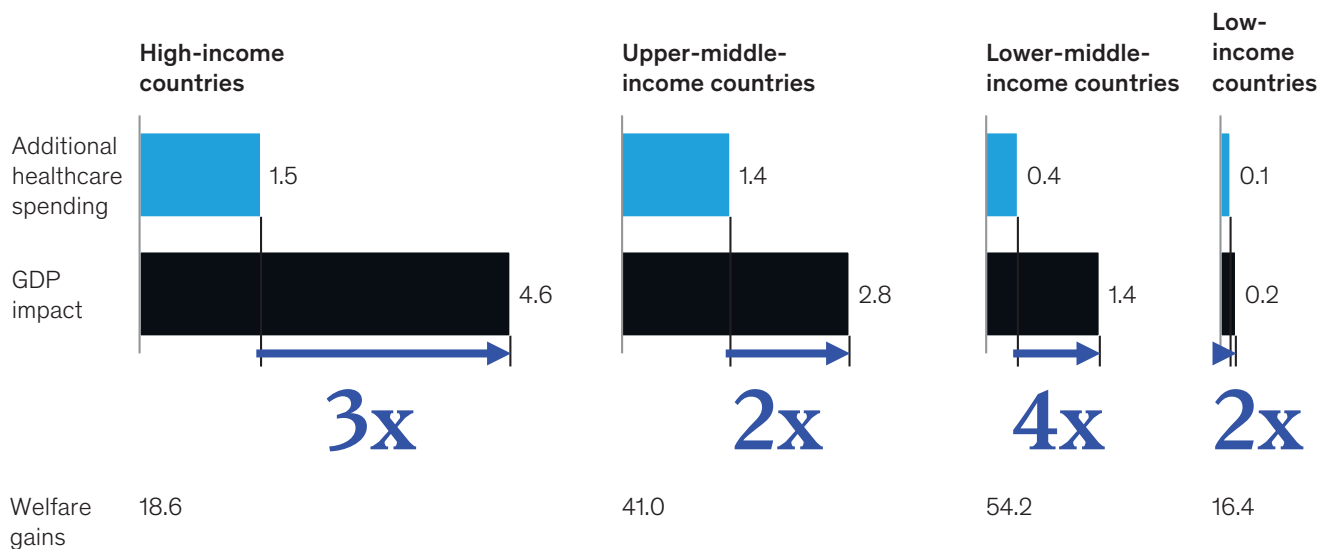
of digitization. Longer term, greater use of automation and artificial intelligence could also increase productivity. In the lowest-income countries, costs are relatively higher than in lower-middle-income countries due to limitations of existing health infrastructure and services. In low-income countries, we estimate that the additional spending required would be about two percentage points of GDP.⁴¹

Exhibit E9

For each \$1 invested in improving health, an economic return of \$2 to \$4 is possible.

Healthy growth scenario, 2040

\$ trillion



Note: Snapshot view of the healthy growth scenario in 2040. Additional healthcare spending, GDP impact, and welfare gains directly attributable to better health only (excluding expanded participation).

Source: Institute for Health Metrics and Evaluation, used with permission, all rights reserved; Oxford Economics; ILOSTAT; National Transfer Accounts project; WHO, *Updated Appendix 3 of the WHO global NCD action plan 2013–2020*, April 2017; "Disease Control Priorities 3 (DCP-3): Economic evaluation for health," University of Washington Department of Global Health, 2018; Tufts Cost-Effectiveness Analysis Registry; McKinsey Global Institute analysis

Realizing the health opportunity would require a pivot to prevention within healthcare systems and societies more broadly

Capturing the benefits that we identify in this report would require a focus that extends beyond what we typically think of as healthcare. That means it would necessitate change by governments and regional authorities, companies, innovators, and communities to shape environments and societies in ways that promote healthy lives and capture the societal and economic benefits we size. The COVID-19 pandemic provides a unique moment to engage governments, companies, and communities around the world in this endeavor. The pandemic has exposed deep vulnerabilities in healthcare systems, supply chains, and social structures, and vast inequities that need to be addressed. As societies emerge from the immediate crisis, we can aspire to do more than plug gaps and hope for recovery. We can build a better healthcare system and a stronger, more resilient global economy that delivers better health for all and shared prosperity for decades to come. To help realize that opportunity, we identify four imperatives: make healthy growth a social and economic priority; keep health on everyone's agenda; transform healthcare systems; and double down on innovation in therapeutics and beyond.

⁴¹ This estimate assumes that the health services would be provided at the state-of-the-art efficiency and productivity, with costs per unit of activity 22 percent lower than they are today in real terms.

Each of these imperatives should be tailored to specific cohorts. For example, cutting across all these imperatives is the need to rethink aging. While many countries are already experiencing rapid aging in their populations, this will only increase as health outcomes improve. This older, healthier cohort will contribute positively to societies and economies in many ways, as active citizens, family members, consumers, volunteers, and, for some, workers and entrepreneurs. Globally, the boost to consumption in 2040 from healthier people living longer could be some \$1.8 trillion. It will be necessary to consider how to adapt environments, housing and living arrangements, workplaces, and recreational facilities for an older population.

Highlights of these four imperatives include:

1. **Make healthy growth a social and economic priority.** Our analysis shows that investing in health can be a critical lever for future growth and an important part of the economic policy debate. Instead of thinking of health as a cost to manage, focusing on health as an investment can deliver significant social and economic returns. Governments around the world are in the driver's seat and should consider developing and delivering healthy life agendas, including labor market and employment policies, that deliver both health and economic benefits. Imperatives include the following:
 - **Develop and deliver an integrated healthy life agenda.** As governments lead their citizens out of the COVID-19 pandemic, they have an opportunity to integrate health into decision making in all policy areas. For example, they can harmonize investments, incentives, and services in public health, physical and mental health, education, labor, research and development, and social services. In parallel, governments may need to work more closely with the tech sector to integrate and embed robust data and advanced analytics into health monitoring, policy development, and decision making.
 - **Prioritize rethinking labor and employment policies.** Ensuring that individuals can work in an environment that maximizes their physical and mental health would go a long way toward realizing the health benefits we size. This might include broadening opportunities for people with disabilities and encouraging the participation of older workers in the labor force by addressing work discrimination and financial disincentives to extend working lives. Promoting a safe work environment to better match the physical and behavioral health needs of workers would also be key.
2. **Keep health on everyone's agenda.** The COVID-19 pandemic forced health onto the agenda of every organization and every household around the world. Keeping it there can deliver significant benefits. Long-term prevention and health promotion, which encompasses more than 70 percent of the benefits we identified, cannot simply be left to healthcare providers or healthcare systems. It is quite literally everybody's business. Some examples of steps to consider include:
 - **Advance healthy communities.** Too few people today live in communities where making healthy choices is an affordable or achievable option. Policies promoting healthy environments and behaviors can make a difference, for example by ensuring clean water and sanitation, building affordable housing, improving road safety, encouraging physical activity, and making children's health a priority in schools. Companies have a role to play, too. By acknowledging, monitoring, and improving their organizational health footprint, companies can make a positive impact on the communities they operate in.
 - **Advance healthy and inclusive workplaces.** To take advantage of the health opportunities, employers can invest more fully in the health and wellness of a diverse set of employees. Some focus areas to consider include occupational health and safety and providing health education, incentives for healthy behaviors, and fitness and medical services, while ensuring preparedness and employee protection in times of heightened health risk. Companies could also adapt workplaces to draw on the entire labor force. This includes providing policies, assistive technologies, and training, and creating a culture that addresses discrimination in order to attract and retain older workers and people with disabilities. A workplace that introduces flexible working for people with

\$1.8T

boost to consumption in 2040

caring responsibilities and policies that support transitions/reentry into the formal labor force could help informal caregivers to stay in work.

3. **Transform healthcare systems.** The COVID-19 pandemic has exposed vulnerabilities in healthcare systems everywhere. Taking the opportunity to strengthen and reimagine systems may not only ensure better preparation for future crises but also deliver healthcare more effectively. The challenge is making and sustaining changes that shift to preventive health while ensuring resilience and flexibility. This will involve high-quality and holistic primary care and services that address behavioral and social health needs, like housing, deploying a broader range of delivery channels to reach people when and where they are most likely to benefit. The current incentives in many healthcare systems and organizations are not sufficient to ensure this transition and require a fundamental reassessment. Some examples of steps that could be considered include:
 - **Reorient and strengthen the healthcare system.** Governments are facing immediate needs for addressing weaknesses in supply chains, information sharing, coordination, and planning. But they can do much more in the process to ensure that the most effective proven interventions are available to all who could benefit. In low-income countries, this could mean developing an adaptable and community-focused healthcare infrastructure to broaden access and ensure that the most effective interventions are available at scale. High-income countries may need to reorient infrastructure toward primary and community care, addressing social determinants of poor health, and improving access for underserved communities. In many cases, this could mean revisiting incentives to encourage the adoption of more effective care. For example, closer collaboration between pharmaceutical and medical technology companies, payers, and providers could help achieve the necessary pivot to prevention and community healthcare and scaling of the most effective interventions.
 - **Introduce next-generation healthcare delivery.** Providers and healthcare systems leaders could help rebuild and reimagine healthcare systems by embedding innovations and productivity improvements—some of which the COVID-19 pandemic has already catalyzed—and promoting infrastructure that is more community based, holistic, and tech-enabled. Payers can consider encouraging more innovative care delivery through closer connection with healthcare providers and engaging members through digital and virtual channels (building on many successful experiments from the crisis).
4. **Double down on innovation.** As the world awaits a vaccine or an effective treatment for COVID-19, the vital role that innovation plays for health and the global economy could not be more evident. Innovations will continue to be critical to improving the health of the world's population. Today a little over a half of the \$300 billion in global R&D spending on healthcare comes from the private sector.⁴² Promising innovations include genomics to deliver more targeted prevention and treatment; data science and AI to detect and monitor disease and enhance research; tech-enabled delivery to expand and reimagine access; and advances in the understanding of the biology of aging. However, realizing the full potential of the innovation pipeline may require shifting economic incentives to reward the areas with greatest need and highest return. Steps that could be considered include:
 - **Expand and align research and innovation with societal priorities.** We find that the level of research effort for some disease areas—for example, mental and neurological disorders, cardiovascular disease, and communicable diseases—is considerably lower than their disease burden. Treatment for established disease is more likely to be reimbursed by insurers and is rewarded much more than health promotion, preventive care, or early intervention. As a result, potentially transformative innovations for preventive interventions can be difficult to monetize. This thinking flows through to the research agenda, where the economic case for investing in prevention and health promotion is often challenging. Intensifying research in areas with large unmet needs,

⁴² Parexel Biopharmaceutical R&D Statistical Sourcebook 2017/2018, Barnett International, 2019.

how to sustain behavioral change, healthcare delivery to boost access, and creating innovative funding models can help.

- **Build more collaborative and effective approaches to R&D.** Accelerated and collaborative ways of working, developed in the heat of the COVID-19 crisis, could be sustained and focused to drive R&D investment, expand innovation in other areas with unmet needs, and develop more effective preventive actions. This may require governments, academic institutions, and philanthropic organizations to reassess their research agendas. Multiple-stakeholder partnerships, streamlining R&D processes, and harmonizing regulatory environments can help. Expanding efforts to reduce the time delay—often of a decade or more—that too often exists between transformative innovations reaching high-income markets and their availability in all regions could be important, too.


Realizing the healthy growth opportunity that we size in this report requires a coordinated effort by all stakeholders—governments, companies, and health institutions—to promote change within healthcare systems and beyond. But today, in the face of the COVID-19 pandemic, a unique opportunity to do just that has emerged. The benefits would be large: a \$12 trillion economic opportunity, hundreds of millions of lives saved, and better health in the global population. Could there be a more important objective than making the world both healthier and more prosperous?

As societies emerge from the immediate crisis, we can aspire to do more than plug gaps and hope for recovery. We can build a better healthcare system and a stronger, more resilient global economy that delivers better health for all and shared prosperity for decades to come.

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